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United States Courts
Southern District of Texas
FILED
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David J. Bradley, Clerk of Court

IN THE UNITED STATES DISTRICT COURT
FOR THE SOUTHERN DISTRICT OF TEXAS
GALVESTON DIVISION

[SEALED],	§	CIVIL NO: ______________
	§	
Plaintiff,	§	**ORIGINAL COMPLAINT FOR VIOLATIONS OF FEDERAL FALSE CLAIMS ACT**
v.	§	
	§	**<u>FILED UNDER SEAL</u>** PURSUANT TO 31 U.S.C. § 3730(b)(2)
[SEALED],	§	
	§	**<u>DO NOT PUT ON PACER</u>**
Defendant.	§	**<u>DO NOT PLACE IN PRESS BOX</u>**
	§	<u>JURY TRIAL DEMANDED</u>

IN THE UNITED STATES DISTRICT COURT
FOR THE SOUTHERN DISTRICT OF TEXAS
GALVESTON DIVISION

UNITED STATES OF AMERICA *ex rel.* Dino Perrotti, Plaintiff, v. THE BOEING COMPANY, Defendant.	§ § § § § § § § § § § § § § §	CIVIL NO: ______________ RELATOR DINO PERROTTI'S ORIGINAL COMPLAINT **<u>FILED UNDER SEAL</u>** PURSUANT TO 31 U.S.C. § 3730(b)(2) <u>JURY TRIAL DEMANDED</u>

<u>RELATOR DINO PERROTTI'S ORIGINAL COMPLAINT</u>

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1. On behalf of the United States of America, and on his own behalf, Plaintiff/Relator Dino Perrotti ("Perrotti" or "Relator") brings this action pursuant to the federal False Claims Act (FCA), 31 U.S.C. § 3729-3732. Relator seeks to recover all damages, penalties, and other remedies established by the FCA on behalf of the United States and on his own behalf. Relator would respectfully show the following:

I. INTRODUCTION TO CASE

2. NASA is in the process of developing the Space Launch System (SLS) rocket, which is a super heavy-lift rocket designed for missions beyond the Earth's orbit. In 2007, NASA awarded Boeing a $335 million cost-plus-award-fee contract to design and develop a crew-launch vehicle for use in the Constellation Program. The Constellation Program was scrapped in 2010, however, and Congress then directed NASA to utilize the Constellation Program contracts for the SLS program.

3. In 2012, NASA issued Modification 96, which incorporated the SLS requirements into the Boeing contract and increased funding for the project by $1.1 billion. Boeing began work, and the contract was finalized with Modification 127 in 2014. Modification 127, valued at $4.2 billion, requires Boeing to build two SLS Core Stages for the rocket. The Core Stage houses the engine, hydrogen and oxygen tanks, an intertank connecting the oxygen and hydrogen tanks, as well as flight computers, cameras, and avionics.

4. In 2016, after delays in development, NASA and Boeing agreed to Modification 173, which added $1 billion to the contract and extended the delivery date. In 2017, NASA and Boeing agreed to Modification 200, worth approximately $1 billion, to add development of the Exploration Upper Stage. The multiple contract modifications increased the contract's total value to approximately $6.2 billion.

5. Boeing's contract requires it to program the rocket's software, which requires running tens of thousands of tests on the software to work out any bugs.

6. Relator worked for Boeing as a contracted software engineer from January 2019 to December 2019 and was part of a team of engineers contracted to develop the SLS rocket. Relator was assigned the role of "lab coordinator" for the User Apps and Display Team (UAD), which also worked closely with the Systems Team (SYS). The UAD and SYS teams were responsible for software integration of C++ code for launch control and testing for the Boeing SLS First Stage rocket engine for the NASA Green Run Launch testing. Relator coordinated lab activities, including coordinating engineers in testing, managing builds, and configuring the rocket and test stand model simulations. He also assisted with development of software debugging, implementing code fixes, and release management, and he was mostly responsible for CSCI testing, integration, system testing, installation, and unit testing.

7. Relator was shown stacks of binders containing test cases that the software testers should run, but test team members, such as Jose De Hoyos, told Relator that Boeing only ran a much smaller fraction of tests. Relator and the other developers insisted that, due to the size and complexity of the code, the software required much more testing than the testers had been instructed to perform. Whenever Relator and other developers brought the issue up to management, however, they were ignored and their concerns minimized. Many of the principal and senior engineers confided in Relator that whenever they wrote a bug, they got their "hand slapped" by management. Melissa Hofman, one of the testers who worked with Relator, used that exact phrase. In fact, it became an open secret that management did not want to discover bugs. The test team assumed that the tests would eventually be run or that Boeing wanted to represent to NASA that the code was complete. Few, if any, of the developers felt that the software was

adequately tested. When developers questioned why more thorough testing was not being conducted, Boeing's "Change Control Board" often gave the excuse that the software was designed to work with the assumption that the console users would never make a mistake, which is a dangerous assumption. The developers came to realize that Boeing's management only cared about speed as opposed to quality and safety. In addition, the developers did not know the "Change Control Board" members and had no method of discussing any issues with them.

8. In December 2019, Boeing terminated Relator and the team of engineers and replaced them with younger and less experienced engineers, who were less likely to discover the quality issues that the more experienced engineers discovered, much less complain to management about them.

9. In January 2020, more than two years behind schedule, Boeing declared the "Stage Controller" software, which is designed to perform every function required to launch the rocket, ready for the "Green Run," which is projected to take the majority of 2020 to complete. In the Green Run, which is being conducted at the Stennis Space Center in Mississippi, each of the systems on the Core Stage will be activated and tested to confirm whether they perform as expected. If the systems in the Core Stage function properly during the Green Run, the Core Stage will then be transported to the Kennedy Space Center for launch preparations.

10. If the software itself is flawed, however, then it will not uncover safety-critical flaws in the hardware, which puts the lives of astronauts at risk. Relator is bringing this case to ensure that the SLS rocket meets the high safety standards it needs to meet to avoid another Challenger disaster.

II. JURISDICTION AND VENUE

11. Jurisdiction and venue are proper in the Southern District of Texas pursuant to the False Claims Act (31 U.S.C. § 3732(a)), because Relator's claims seek remedies on behalf of the United States for multiple violations of 31 U.S.C. § 3729, some of which occurred in the Southern District of Texas. Defendant engages in business in the Southern District of Texas and is subject to general and specific personal jurisdiction pursuant to 31 U.S.C. § 3732(a) in that the claims for relief in this action are brought on behalf of the United States for multiple violations of 31 U.S.C. § 3729.

III. INTRODUCTION TO RELATOR DINO PERROTTI

A. Background on Relator

12. Relator has over thirty-five years of experience as a software professional and extensive experience in all aspects of the software development lifecycle. He also has a security clearance.

13. Relator worked as a contracted senior software engineer at Boeing from January 2019 until December 2019. Mr. Perrotti was the software lead and "lab coordinator" for the User Apps and Display Team (UAD), which was responsible for software integration of C++ code for launch control for the Boeing SLS First Stage rocket engine for the NASA Green Run Launch. Mr. Perrotti coordinated lab activities, developed software, debugged and implemented code fixes, and was responsible for CSCI testing, integration, formal system testing, release management, installation, and unit testing.

14. Most of the bugs the UAD team tested were filtered through Mr. Perrotti, because he provided the setup environment to run the tests and managed the team's test schedule. Mr. Perrotti also ran most of the tests for the remote engineers unable to access the simulator at

Boeing's facility in Titusville, Florida. This was a courtesy that Mr. Perrotti volunteered to perform to help the team become more efficient, as Boeing management would fly software engineers back and forth from their home bases (e.g., Seattle) to Titusville where the simulators were located.

15. Relator's work history and accomplishments in the software industry prior to his time at Boeing are impressive. For example, Relator's experience includes:

- Leading a team of engineers to test, debug, and fix avionics code for Pratt and Whitney F-135 military jet engine FADEC software designed for the Joint Strike Fighter F-35 (Belcan Corporation, 2016).

- Developing real-time embedded C/C++ code software for the JAGM missile program (Lockheed Martin, 2010).

- Developing software for a military training player unit simulator called OneTESS and JTRS, including developing tasks to process and display real-time military training engagements and weapon simulation. Relator worked closely with the Quality Assurance team to identify intermittent bugs, such as boost reference counter bugs. Relator also identified errors in and optimized input processing (General Dynamics, 2008 – 2009).

- Developing and integrating test teams of dozens of engineers and testers for real-time military applications such as the F-35 Joint Strike Fighter, C-17 radar, Boeing 777, and the Boeing 87 Dreamliner (Contracted through Entegee for several companies, 2000 – 2007).

- Working with Boeing to develop the Boeing 747 Air Force One, including writing new system requirements, which involved adding an additional Electronics Flight Simulation System (EFIS)[1] to the cockpit (Allied-Signal Aerospace, 1985 – 1988).

B. Original Source and Disclosures

16. There are no bars to recovery under 31 U.S.C. § 3730(e), or in the alternative, Relator is an original source as defined therein. Relator has direct and independent knowledge of the information on which his allegations are based. To the extent that any allegations or transactions herein have been publicly disclosed, Relator has knowledge that is independent of and

[1] The EFIS contains the two main displays (Altitude Indicator and the Compass Card) which include most flight information required to take off, fly, and land an aircraft.

materially adds to any publicly disclosed allegations or transactions and provided this information to the United States prior to filing a complaint by serving voluntary pre-filing disclosure statements on January 31, 2020 and February 18, 2020.

17. As required pursuant to 31 U.S.C. § 3730(b), Relator will serve his Original Disclosure Statement on the Attorney General of the United States and the United States Attorney for the Southern District of Texas, as well as all material evidence and information, contemporaneously with the service of this Original Complaint.

IV. THE BOEING COMPANY

18. Defendant The Boeing Company ("Boeing") was incorporated in Delaware and is headquartered in Chicago, Illinois. Boeing's corporate office is located at 100 North Riverside, Chicago, Illinois 60606. Boeing's registered agent is Corporation Service Company, 211 East 7th St., Suite 620, Austin, Texas 78701.

19. Boeing is the world's largest aerospace company and the biggest manufacturing exporter in the United States, supporting airlines and U.S. and allied government customers in more than 150 countries. Boeing's products include commercial and military aircraft, satellites, weapons, electronic and defense systems, launch systems, advanced information and communication systems, and performance-based logistics and training.

20. NASA awarded a multi-billion dollar contract (contract no. NNM-12AA-82C) to Boeing to develop two Core Stages of the SLS rocket. In 2016, NASA increased the value of the contract by approximately $1 billion as a result of Boeing's delays, and in 2017, NASA again increased the contract's value by $1 billion. The SLS project has experienced multiple delays, putting it several years behind schedule, as well as massive cost overruns totaling billions more than the original estimate for the project.

V. RESPONDEAT SUPERIOR AND VICARIOUS LIABILITY

21. Any and all acts alleged herein to have been committed by Defendant were committed by officers, directors, employees, representatives, or agents, who at all times acted on behalf of Defendant and within the course and scope of their employment, or by corporate predecessors to whom successive liability applies.

VI. FEDERAL ACQUISITION REGULATION ("FAR")

A. Overview

22. The Federal Acquisition Regulation ("FAR") is a system of regulations jointly issued by the Department of Defense, the U.S. General Services Administration, and the National Aeronautics and Space Administration for use in acquiring goods and services in a uniform manner for government contracts. The FAR is codified in Title 48 of the United States Code of Federal Regulations.

23. The NASA FAR Supplement ("NFS") is a system of regulations administered by NASA for the purpose of implementing and supplementing the FAR. The NFS sets forth any NASA-specific deviations from FAR requirements and should be read in conjunction with the primary set of rules in FAR.

B. Contracting by Negotiation

24. Part 15 of the FAR describes the policies and procedures for awarding and entering into a negotiated contract. A contract awarded using a process other than a sealed bid process is a negotiated contract. 48 C.F.R. § 15.000. The objective of selecting a source for an item under a negotiated contract is to select the proposal that represents the best value. 48 C.F.R. § 15.302.

25. An award is based on many evaluation factors. Although the evaluation factors are largely discretionary dependent upon the particular contract at issue, certain factors must be taken

into consideration, including the price or cost to the Government, the quality of the service provided, and the past performance. 48 C.F.R. § 15.304(b).

26. With regard to the first factor, cost or price evaluation, a contracting officer performs a cost realism analysis to determine if the costs in an offeror's proposal: a) are realistic for the work to be performed, b) reflect a clear understanding of the requirements, and c) are consistent with the various elements of the offeror's technical proposal. *See* 48 C.F.R. § 1815.305(a)(1)(A).

C. Contractor Responsibilities

27. Pursuant to 48 C.F.R. § 46.105(a), the "contractor is responsible for carrying out its obligations under the contract by: (1) controlling the quality of supplies or services; and, (2) tendering to the Government for acceptance only those supplies or services that conform to contract requirements." The control of quality by the contractor may relate to, but is not limited to "procedures and processes for services to ensure that services meet contract performance requirements." 48 C.F.R. § 46.105(c).

D. Submission of Claims to the Government

28. Pursuant to 48 C.F.R. § 32.905(a), the basis for payment is on receipt of a proper invoice and satisfactory contract performance. With the limited exception of interim payments on cost-reimbursement contracts for services, all invoice payments must be supported by a receiving report or any other Government documentation authorizing payment. 48 C.F.R. § 32.905(c). Documentation must include, at a minimum, description of the supplies delivered, or services performed, and quantities of supplies received and accepted, or services performed. 48 C.F.R. § 32.905(c)(2) and (3).

29. Pursuant to 48 C.F.R. § 32.007(a)(1), contract financing payments are due the thirtieth day after the designated billing office receives "a proper contract financing request." A proper contract financing request "must comply with the terms and conditions specified by the contract," and the contractor must correct any defects in requests submitted. 48 C.F.R. § 32.007(c).

E. Contractor Certifications

30. The general FAR invoice requires the contractor to certify that the voucher is proper. Specifically, Standard Form 1034 states, before the contractor's signature line: "I certify that this voucher is correct and proper for payment." 48 C.F.R. § 53.301-1034. By certifying that the voucher is proper for payment, the contractor certifies that the voucher is a good faith request for payment in accord with the contract.

31. Contractors are also required to make the following certifications when submitting any claim exceeding $100,000: "I certify that the claim is made in good faith; that the supporting data are accurate and complete to the best of my knowledge and belief; that the amount requested accurately reflects the contract adjustment for which the contractor believes the Government is liable; and that I am duly authorized to certify the claim on behalf of the contractor." *See* 48 C.F.R. § 33.207I.

F. Consequences of Noncompliance

32. A contractor may be debarred if found liable for commission of fraud in connection with obtaining, attempting to obtain, or performing a public contract. *See* 48 C.F.R. § 9.406-2(a)(1). Furthermore, knowing failure by a principal to timely disclose to the Government credible evidence of a violation of the False Claims Act, or significant overpayments on the contract, constitutes grounds for disbarment. *See* 48 C.F.R. § 9.406-2(b)(1)(vi)(B) and (C). Moreover, the

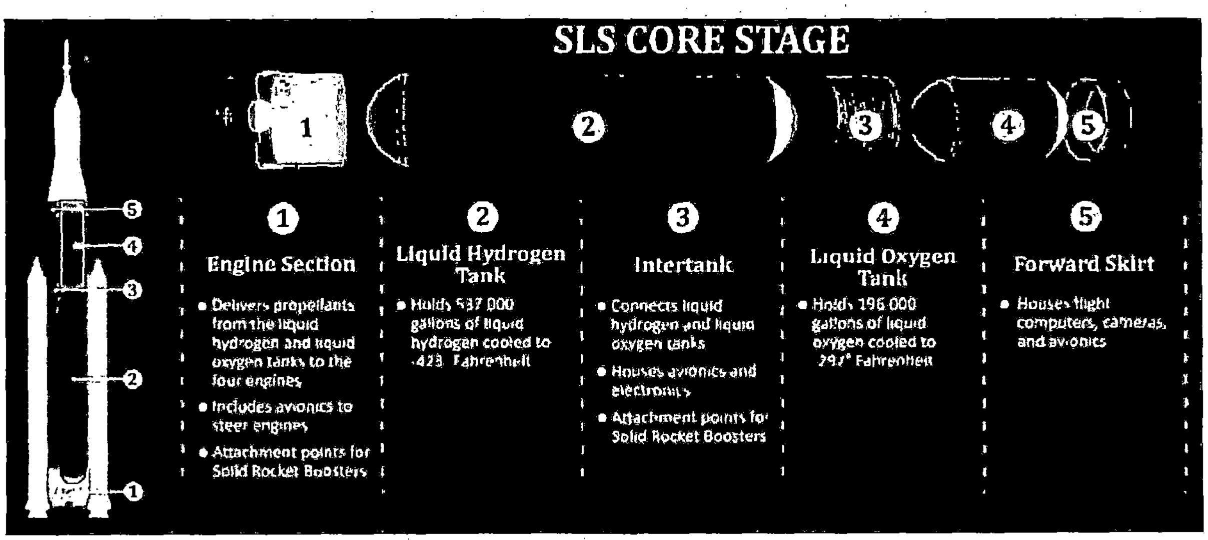
Government may reduce or suspend contract payments upon a finding of fraud. *See* 48 C.F.R. § 32.006-1(b).

VII. Overview of the Space Launch System Rocket and Boeing's Contract

33. NASA is in the process of developing the SLS rocket, which is a super heavy-lift rocket designed for missions beyond the Earth's orbit.

34. In 2007, NASA awarded Boeing a $335 million cost-plus-award-fee contract to design and develop a crew-launch vehicle for use in the Constellation Program. The Constellation Program was scrapped in 2010, however, and Congress then directed NASA to utilize the Constellation Program contracts for the SLS program.

35. In 2012, NASA issued Modification 96, which incorporated the SLS requirements into the Boeing contract and increased funding for the project by $1.1 billion. Boeing began work, and the contract was finalized with Modification 127 in 2014. Modification 127, valued at $4.2 billion, requires Boeing to build two SLS Core Stages. The Core Stage houses the engine, hydrogen and oxygen tanks, an intertank connecting the oxygen and hydrogen tanks, as well as flight computers, cameras, and avionics:



36. In 2016, after delays in development, NASA and Boeing agreed to Modification 173, which added $1 billion to the contract and extended the delivery date. In 2017, NASA and Boeing agreed to Modification 200, worth approximately $1 billion, to add development of the Exploration Upper Stage. The multiple contract modifications increased the contract's total value to approximately $6.2 billion.

37. In January 2020, and over two years behind schedule, Boeing delivered the first Core Stage to the Stennis Space Center in Mississippi to begin the Green Run campaign, which is projected to take the majority of the year to complete. In the Green Run, each of the systems on the Core Stage will be activated and tested to confirm whether they perform as expected. If the systems in the Core Stage function properly during the Green Run, the Core Stage will then be transported to the Kennedy Space Center for launch preparations.

VIII. Background on Boeing's Procedures

38. To run a "test case," an engineer sets up inputs and then runs the code to confirm that the results are as expected. When a bug is written, a test procedure is written that describes how to reproduce the bug. A test procedure is the procedure performed to run the test case, and it is called an "integration sheet."

39. When developers compile software and attach an ID to it, it is called a "new build." Developers would submit their code for integration testing daily. The next day the build team would create a special build called "Plygnd-XX.YY," which contains all the previous good code with the new code to be "tested."

40. These daily builds are called integration builds, or "playground builds." Engineers can test these builds on a simulator. Then once those fixes were verified in the daily "playground" builds, the build team would create a weekly build called a "minor build." The minor build takes all the code from the week that passed "integration" testing and creates a new build. Engineers and

testers who wrote the bugs use these software builds for validation tests, which validates that the software bug has been fixed.

41. Formal Qualification Testing (FQT) is performed by a team of testers who are supposed to run exhaustive tests on the code to uncover bugs. In Relator's experience prior to working on the SLS project, there are usually hundreds, if not thousands, of bugs written after FQT. After Boeing's team ran FQT, however, it sent a suspiciously few number of bugs to Relator and his team to fix. Relator and his team found more bugs by accident than Boeing's team did during FQT. It became obvious to Relator and the testers that Boeing's team was not making a serious attempt to find bugs during FQT and were likely just running a subset of tests that Boeing knew would pass.

IX. DEFENDANT'S MISMANAGEMENT OF THE SLS PROJECT

A. Boeing's laboratory, simulator equipment, and staffing levels were insufficient for the job at hand.

42. The United States contracted with Boeing to provide a rocket capable of safely and reliably transporting astronauts on missions to Mars and other destinations beyond the Earth's orbit. Instead of working to give the United States the safe and reliable product for which it bargained, however, Boeing cut corners.

1. Boeing's laboratory was disorganized and lacked quality control procedures.

43. When Relator began working at Boeing in January 2019, there was only one lab (the "integration" lab) devoted to testing and debugging software for use in the SLS rocket. *See* exhibit 1 (December 15, 2019 (2:21 AM) email from Relator to Mathew Weaver and Eric Gietl identifying "the most important risk to our project" as "limited access to the one and only lab (integration lab). The UAD team often had to work deep into the evening, sometimes until 2 or 3 AM waiting to use the lab.").

44. The integration lab was disorganized, lacked quality control procedures, and the activities in the lab were not coordinated in any way whatsoever. For example, engineers would start running tests on a workstation without asking or consulting with anyone, because there was no one to ask. Engineers would often leave workstations running and walk away. Another engineer would start using the workstation without knowing what the last person did. At the end of each night, about half of the workstations were in an unknown state. There were no rules and procedures with regard to that lab.

45. Boeing had a second lab that was not being used, and Relator asked that engineers be allowed to start using this lab as well so that testing could be done in parallel with fixing bugs. Management allowed the engineers to start using the second lab, which was called "Dev Set 2," and Relator began acting as the lab coordinator.

46. Relator created rules and procedures for Dev Set 2 in an effort to improve the quality of work. *See* exhibit 2 at 4, item 2 "Lab Rules" (December 19, 2019 email from Relator to Mark Sholtis with EASI). For example, the new rules required engineers to 1) reserve time in the lab, 2) leave the workstation as they found it, 3) write their names and the test they were running on a clipboard so that the next user would know the state of the system, and 4) leave a "work in progress" sheet on the workstation if taking a break during a test so that no one else would start using the workstation and nullify the prior user's work.

47. Relator was baffled as to why any lab, much less one being used to build a *rocket*, lacked such basic organization and quality controls. He continually found that disregard for quality was par for the course for Boeing.

2. Boeing's simulator equipment was woefully inadequate.

48. Boeing had two simulators but was only using one when Relator began working there. The one being used, known as "CSS2," had a lot of actual hardware connected to it, and it was connected to the integration lab. Relator and other engineers asked Boeing's management to connect the second simulator, known as "CSS1," but management refused to do so. It was not working properly, and management refused to fix it.

49. One of the engineers in the test group, Gene Brotherton, grew frustrated with the fact that Boeing would not fix the second simulator, especially because the engineers were falling behind on deadlines that management was pressuring them to meet. In March or April of 2019, Mr. Brotherton took it upon himself to fix the second simulator, so that the testers could use it in the Dev Set 2 lab. *See* exhibit 2 at 4, item 4 "Dev Set 2" (December 19, 2019 email from Relator to Mark Sholtis with EASI); *see also* exhibit 1 (December 15, 2019 (2:21 AM) to Mathew Weaver and Eric Gietl).

50. Unlike CSS2, which was connected to actual hardware, the CSS1 simulator in the Dev Set 2 lab was connected to simulated hardware. Initially, Mathew Weaver, the Software Technical Lead for the UAD group, told the engineers that management would allow them to use the CSS1 simulator for preliminary "integration" testing but not for "validation" testing, which is the testing that engineers conduct in order to "validate" a bug fix by verifying that the code written to fix the bug actually worked. Validation testing should only be run on a simulator connected to actual hardware.

51. Shortly after Mr. Weaver told the engineers that Boeing's management said that they could not use CSS1 to validate bug fixes, Mr. Weaver told the engineers that management had given the green light for the engineers to use CSS1, a simulator connected to simulated

hardware and not actual hardware, for validation testing. Boeing's management did this out of fear that it would fail to meet contractual deadlines.

52. Neither of the simulators functioned properly, and they would stop running after a few hours, which invalidated tests. Whenever the simulator stopped working, Mr. Brotherton and Relator would bring down some of the servers, reset them, and start the setup process, which took a couple of hours. *See, e.g.,* exhibit 3 at 2 (Relator's timesheet for April 16, 2019 showing he spent over two hours debugging "simulation issues"). Relator has many examples of simulations that would stop working, including FC1, FC2, FC3, CTC-1, and CTC-2. Boeing's management was fully aware that the simulators did not function properly, but they refused to spend the time and money to fix them. When Relator and others complained to Eric Gietl, a Boeing manager, about the simulators not functioning properly, Gietl changed the subject. Engineers such as Relator, Mr. Brotherton, and Martin Ripper were beyond frustrated that management could not care less about the quality of the work being performed.

3. Boeing did not adequately staff the SLS project.

53. When Relator began working at Boeing, there were less than seven people running tests daily, even though Boeing's lab had over seventeen test terminals. Boeing's control room mock-up was almost empty most of the time. The lack of testers surprised Relator, as there were thousands of tests that needed to be run, and management kept emphasizing deadlines. Relator spoke with other testers and asked why there were so few of them even though they had a high volume of work and major deadlines. He was told that management did not listen to them and did not seem to care. Relator also spoke with people in management positions to ask if they could get more help, but management did not provide any. *See* exhibit 2 at 3, item 1 "More Testing" (December 19, 2019 email from Relator to Mark Sholtis with EASI).

54. By way of example, there were only two employees testing the terminal count sequence (TCS): Kevin James, who was responsible for developing the TCS, and Relator, who helped him. Developing and testing the TCS, which controls the countdown and launch of the rocket, requires extensive setup. It is also a very complex and time consuming process, because there are over fifty programs that must be tested, most of which are dependent on the execution of other programs. If any program fails, subsequent programs that depend on the execution of the prior program will not execute, and the countdown will hold at certain points in time. Whenever a program failed, the system had to be set up again, which was a major task.

55. Relator asked management if others on the test team could help with setting up the system to test the TCS. Even Relator's technical lead, Mathew Weaver, asked for that assistance during meetings with upper management and was denied. Mr. Weaver told Relator that he could not understand why management continuously refused to assist with the process. Finally, as the deadline for completion loomed, Boeing brought in a large number of engineers to finish the task.

56. Rather than consistently employing the amount of testers needed in order to meet deadlines while still ensuring quality control, Boeing's practice was to bring in a large number of engineers at the last minute when the project got down to the wire. Consistent progress and quality control simply were not priorities for Boeing.

B. Boeing ran a mere fraction of the test cases that it should have run.

57. In order to run a test case, the tester sets up inputs and then runs the code to confirm whether the results are as expected. In other words, a tester is trying to make sure that the code actually works.

58. One of the contractors on the test team with Relator, Jose De Hoyos, showed Relator a giant binder containing test cases. Relator asked how many binders of test cases Boeing

had, and Mr. De Hoyos told him that there were "a lot." Relator asked Mr. De Hoyos whether Boeing was going to run all of the test cases, and Mr. De Hoyos told him no. When Relator asked Mr. De Hoyos whether the testers went through a large majority of the test cases, Mr. De Hoyos looked around and then quietly told Relator, "Not even close."

C. Boeing prioritized speed over quality and discouraged testers from finding bugs.

59. Boeing discouraged software testers from looking for bugs in the code they were testing. For example, Melissa Hofman, one of the testers who worked with Relator, was very dedicated to the project and wrote a lot of bugs in an effort to improve the quality of the software. Ms. Hofman complained to Relator several times that every time she wrote a bug, management would "slap her hand" (figuratively) and insinuate that she should not write them.

60. On more than one occasion, Relator and other engineers complained to Mark Lewis, the Project Manager for the UAD software development team, that more quality tests needed to be run. Mr. Lewis told them that they needed to focus on fixing known bugs rather than looking for unknown bugs to fix. He repeatedly gave them a short timeframe of a week to fix the known bugs in an effort to keep the engineers from looking for more.

61. Another contractor, Daniel Rzeszewicz, told Relator that he often found bugs just by looking at the code. Relator would often ask him why Boeing is not performing more testing, and Mr. Rzeszewicz would answer something to the effect of, "I don't understand what they are doing. I'm finding more bugs than they are just by accident."

62. Mr. Rzeszewicz had previously retired from Boeing after working there for approximately thirty years. He came back to work as a contractor on the SLS project, because he wanted to help build a quality rocket. He was not intimidated by management's demands for speed

over quality, and he wrote bugs and found flaws in the code even when management insinuated that he should not do that.

63. On one occasion, management declared a program's code ready for FQT, which are tests used to verify that software meets documented requirements. A "code freeze" was instituted for that code, meaning that testers could not make any more changes prior to the validation testing. Mr. Rzeszewicz disregarded the code freeze and worked to find errors in the code, which he did find. Mr. Rzeszewicz then forced management to lift the code freeze and allow him to work on the code to fix the errors before submitting it for FQT.

D. Boeing's methods for validation testing were ineffective and inherently biased toward achieving positive outcomes.

64. When Boeing's testers submitted software fixes, they were required to use a tool called Parasoft to test the specific functions. Parasoft allows a user to conduct a "white box" test, also considered a "positive" test, which is where the user injects the expected inputs (as opposed to generating them) and then verifies the outputs. In other words, the tester inputs the data that a user should input if using the software correctly. "Positive" testing only tests whether software will work in perfect conditions (e.g., conditions free of human error).

65. During Formal Qualification Testing, a team of engineers run a series of what are supposed to be exhaustive tests on the code to uncover bugs. After most FQT test cycles, there are usually hundreds or thousands of bugs written, which are then sent to testers to resolve. After FQT test cycles at Boeing, however, a suspiciously small amount of bugs were sent to Relator and the rest of the team.

66. For example, Boeing conducted FQT test cycles in November 2019. Mr. Rzeszewicz witnessed a tester passing a test case that should have failed. Mr. Rzeszewicz told the testers and their leads that it needed to be fixed, but no one showed any interest in fixing it. Relator

and the others expected that after the FQT, there would be many bugs for them to fix, and they were surprised when only a small number of bugs were found.

67. It was obvious to Relator and the other testers that the FQT tests that Boeing would run were not really looking for bugs and that they were most likely running a subset of tests that they knew would pass.

E. Boeing failed to fix bugs that it should have fixed.

68. Boeing used a ranking system to categorize bugs in terms of priority. Bugs that were deemed crucial to fix were ranked "1," while bugs deemed least crucial were rated a "5." Boeing's "Change Control Board" determined whether a bug was major or minor, and the vast majority of bugs were classified as a "4–minor" or a "5" and were not fixed.

69. For example, on August 22, 2019, Mathew Weaver emailed Relator and another tester, Benjamin Warren, and asked them to reproduce a bug that had been found and "make sure it is not a problem." *See* exhibit 4 (August 2019 e-mails regarding "trac 3342"). Mr. Warren responded that he had already checked it out, and "there are dozens of CUIs[2] that do not work." *Id.* Relator later followed up on this issue and asked Mr. Weaver whether it had been resolved. Mr. Weaver responded that the problem was deemed to have been caused by the tool that displays CUIs, known as "Demon," and that the code was "working per design," meaning that the code works as long as there are no errors in the inputs. *Id.* Mr. Weaver further stated that the Change Control Board "decided to leave it a 4-minor and for us to not do anything about it. Fixing this is a 'nice to have' so will likely get deferred." *Id.*

[2] "CUI" stands for "Character User Interface," and it is the way users interact with computer programs. CUIs are data packets that contain the raw data that engineers receive from the software, and even one missing CUI could adversely impact the rocket's performance.

70. Another bug that Boeing refused to fix concerned the "APP IOC" button, which turns the input/output of the applications (APPS). If a user selected the APP IOC button to turn off the input/output of the applications, the Graphical User Interface (GUI) screen stopped displaying the applications even though they were still running. A user who did not know that the application was still running would restart the application by pressing the APP IOC button again, which would then cause there to be two instances of the application running and could cause instability in the system. These applications perform critical processing, such as TCS (Terminal Countdown Sequence), TCC (errors) engine, and MPS (Main Propulsion) Fusion. The fusion application is especially vulnerable, as that application takes input and runs an algorithm using the existing value(s), making it highly possible that the data will be corrupted multiple times.

71. Mr. Rzeszewicz noticed that a test claimed that the applications would terminate if the APP IOC button was pushed. Relator confirmed that there was a bug in the APP IOC button by remotely accessing into servers running the apps (sp-ihawk, ss-ihawk) and observing multiple instances of the same software running.

72. Another valuable tool called Process Retrieval ("PROC RET") is supposed to keep track of all CUI changes that occur during a certain time period (e.g., while running a test). A list of input CUIs can be added to the tool to monitor, then a large variety of tests can be run, and then resultant CUIs could be verified after a test is run. It should have been a valuable tool for developers to use in order to be absolutely positive that the software was operating properly. Time and time again, however, there were missing values in the tool and strange results. There was no one person in charge of the tool, and developers could not even write it as a bug because there was no way of knowing if there were any preconditions. Boeing made no effort to fix this issue.

73. There were many types of a "lack of support for testing" to the development team from the test group who spent most of their time just trying to complete the minimum amount of work required by contract. The development team was obviously overworked and undermanned, and there was no path for developers to request support from the test group to ensure that the bugs were indeed fixed and the methods of verifying tests were correct. There was no testing on the PROC RET test tool, which is built into the Stage Controller GUI. In fact, a massive amount of tests could have been executed and validated by using this tool, but there was no effort in training developers or testers on how to use it to write accurate tests. Relator had suggested and requested training on this tool, but Boeing's management disregarded his concerns and requests.

74. Boeing's Change Control Board was overly dismissive of the bugs engineers brought to its attention, giving the excuse that the applications were still "working per design." It is critical that all systems on the rocket work properly. The bugs that Boeing's Change Control Board classified as "minor" may cause major problems later, putting the lives of astronauts at risk.

X. BOEING'S RETALIATION AGAINST RELATOR

75. Relator was an outstanding employee who went above and beyond his job duties, frequently working into the night to ensure that the test team met its deadlines. Boeing hired Relator in January 2019 to work as a member of the test team in a contractor capacity. Even though Boeing did not hire him to serve in a managerial capacity, Relator helped to create a second lab at Boeing, implemented quality control procedures that Boeing should already have had in place, and acted as lab manager.

76. Relator was dedicated to quality control, and he frequently let management know that Boeing's lack of quality control and its discouragement of rigorous software testing could cause systemic instability in the SLS rocket. The SLS rocket is a multi-billion dollar project, and

more importantly, the rocket will be used to propel human lives into deep space. Relator wanted to ensure that the Government was getting the safe, high-quality product that it bargained for.

77. Relator complained many times to management that Boeing was understaffing the project and failing to provide the resources needed to ensure success. For example, when he began working for Boeing in January 2019, he complained to Mathew Weaver and Mark Lewis, the original UAD project manager, that Boeing's failure to provide sufficient resources posed an "important risk" to the project. *See* exhibit 1 (December 15, 2019 (2:21 AM) email from Relator to Mathew Weaver and Eric Gietl identifying "the most important risk to our project" as "limited access to the one and only lab (integration lab)."). Relator also told management that they needed to connect an unused simulator and institute a better quality control program. *Id.*

78. Relator made these complaints to his supervisors and warned them about risks to the project throughout 2019. *See, e.g.,* exhibit 2 at 3, item 1 "More Testing" (December 19, 2019 email from Relator to Mark Sholtis with EASI stating, "I recommended that the team should do more testing. I suggested this several times over the last year.").

79. Throughout 2019, Relator would also send himself emails about unresolved bugs so that he could later follow up to see whether the issue had been resolved. In November 2019, after Boeing ran FQT test cycles and sent a suspiciously low number of bugs to Relator for the test team to resolve, Relator found himself with a lighter workload and decided to review the emails he had previously flagged for follow-up.

80. When Relator sent emails about some of these bugs to his supervisors, Mathew Weaver and Eric Gietl, in early December 2019, Relator was told that he had to start working remotely. Relator began working from home on December 9, 2019, and he sent more emails regarding quality issues and bugs that needed to be resolved.

81. On December 15, 2019, Relator wrote to Mathew Weaver and Eric Gietl and told them once again that Boeing did not have meaningful quality control procedures. *See* exhibit 1 (December 15, 2019 (2:21 AM) email from Relator to Mathew Weaver and Eric Gietl). Relator told them that if the test team had not created a second lab, it would not have met the schedule, because the resources that Boeing devoted to the project were insufficient. *Id.*

82. Relator emailed Mr. Weaver and Mr. Gietl again a few hours later and added that the engineers had lost several days on the project, because the test team could not connect to the simulator after a team Boeing sent to "fix" it failed to ensure that it worked properly. *See* exhibit 5 (December 15, 2019 (2:48 PM) email from Relator to Mathew Weaver and Eric Gietl). He also told them that Boeing had not proved that the simulator with actual hardware would work in the second lab Boeing created. *Id.* ("We never proved the concept that [simulator] CSS2 "should" work with Dev Set 2. I requested to anyone who will listen but there was no follow up (as far as I could tell).").

83. Immediately after sending his second email, Relator was terminated and told to turn in his laptop. Boeing's management fired him with the pretextual excuse that they didn't need highly skilled engineers to write the rest of the code and could do with younger and less experienced engineers. In reality, it was because he complained about the quality issues and the threat that Boeing's practices posed for the project. Boeing wanted to bring in less experienced engineers, because they were younger, less likely to find bugs, and less likely to bring up issues related to quality control.

84. The management at Boeing did not care at all for Relator's complaints and ultimately terminated him because of his dedication to quality control and his efforts to stop Boeing from providing the Government with a shoddy and unsafe product.

XI. ACTIONABLE CONDUCT BY DEFENDANT

A. False Claims Act

1. Applicable Law

85. This is an action to recover damages and civil penalties on behalf of the United States and Relator Perrotti arising from the false and/or fraudulent statements, claims, and acts by Defendant made in violation of the False Claims Act, 31 U.S.C. §§ 3729–3732.

86. The FCA provides that any person who

> (A) knowingly presents, or causes to be presented, a false or fraudulent claim for payment or approval; or
>
> (B) knowingly makes, uses, or causes to be made or used, a false record or statement material to a false or fraudulent claim

is liable to the Government for a civil penalty for each such claim, plus three times the amount of damages sustained by the Government because of the false or fraudulent claim. *See* 31 U.S.C. § 3729(a)(1).

87. The FCA defines "claim" as:

> (A) mean[ing] any request or demand, whether under a contract or otherwise, for money or property and whether or not the United States has title to the money or property, that--
>
> (i) is presented to an officer, employee, or agent of the United States; or
>
> (ii) is made to a contractor, grantee, or other recipient, if the money or property is to be spent or used on the Government's behalf or to advance a Government program or interest, and if the United States Government--
>
> (I) provides or has provided any portion of the money or property requested or demanded; or
>
> (II) will reimburse such contractor, grantee, or other recipient for any portion of the money or property which is requested or demanded. . . .

31 U.S.C. §3729(b)(2).

88. The FCA allows any persons having knowledge of a false or fraudulent claim against the Government to bring an action in federal district court for himself and for the United States and to share in any recovery as authorized by 31 U.S.C. § 3730. The FCA also protects a whistleblower who has suffered retaliation because of his efforts to stop one or more violations of the False Claims Act. *See* 31 U.S.C. § 3730(h).

89. Based on these provisions, Relator Perrotti, on behalf of the United States and on his own behalf, seeks through this action to recover damages and civil penalties arising from Defendant's violations of the False Claims Act.

2. Defendant's Violations of the False Claims Act

a. Presentation of False or Fraudulent Claims (31 U.S.C. § 3729(a)(1)(A))

90. Defendant has knowingly presented false or fraudulent claims associated with its contract with NASA to develop the SLS rocket, contract no. NNM-12AA-82C.

91. Boeing's contract with the United States requires it to provide a high-quality rocket that operates reliably and safely. When Boeing submitted invoices to the United States seeking payment for work performed under the contract, it certified, both expressly and impliedly, that it performed the work as required. In reality, however, Boeing failed to ensure that the software in the SLS rocket met the quality standards for which NASA bargained.

92. Pursuant to 48 C.F.R. § 32.905(a), the basis for payment is on receipt of a proper invoice and satisfactory contract performance. Boeing caused the United States to make payments for services and a product that it would not have made had it known that Boeing failed to adequately staff the project and implement sufficient quality control procedures. The United States only pays for goods and services that are provided in conformity with contract specifications.

93. Boeing's violations of the contractual requirements were material, because they went to the very essence of the bargain for which the United States contracted. The United States believed it was paying for high-quality, bug-free software for the SLS rocket. Boeing instead invoiced the United States for software that it failed to rigorously test. Had the United States known of Defendant's unsatisfactory performance, which resulted in the submission of ineligible claims for reimbursement, the United States would not have paid the claims.

94. By virtue of Defendant's actions, the United States has suffered damages and is entitled to recover treble damages plus a civil monetary penalty for each false claim.

b. Making or Using False Records or Statements Material to False or Fraudulent Claims (31 U.S.C. § 3729(a)(1)(B))

95. Defendant knowingly made or used false records or statements material to false or fraudulent claims paid or approved by the United States. These false statements or records include misrepresentations to NASA regarding Boeing's true progress on the project, as well as certifications related to services performed on the SLS rocket. Boeing also falsely certified that the invoices it submitted to the United States were correct and proper for payment.

96. Boeing's false statements and false records were material to the claims paid by the United States, because they went to the very essence of the bargain for which the United States contracted. The United States believed it was paying for a high-quality, safe rocket capable of reliably transporting astronauts to Mars and other deep-space destinations. Boeing instead invoiced the United States for a rocket with flawed software. Had the United States known of Defendant's unsatisfactory performance, the United States would not have paid the claims.

97. Defendant's false statements and records were material to the Government's decision to pay the claims. Boeing caused the United States to make payments for services and a product that it would not have made had it known that Boeing had such shoddy quality control

procedures and employed insufficient resources. The United States only pays for goods and services that are provided in conformity with contractual requirements.

98. Defendant's false records and statements were foreseeable factors in the United States' loss and a consequence of the scheme. By virtue of Defendant's actions, the United States has suffered actual damages and is entitled to recover treble damages plus a civil monetary penalty for each false claim.

B. Defendant's Retaliation Against Relator

99. Section 3730(h) of Title 31 of the U.S. Code defines whistleblower protection under the FCA as follows:

> (1) Any employee, contractor, or agent shall be entitled to all relief necessary to make that employee, contractor, or agent whole, if that employee, contractor, or agent is discharged, demoted, suspended, threatened, harassed, or in any other manner discriminated against in the terms and conditions of employment because of lawful acts done by the employee, contractor, or agent on behalf of the employee, contractor, or agent or associated others in furtherance of efforts to stop 1 or more violations of this subchapter. . . .
>
> (2) Relief ... shall include reinstatement with the same seniority status that employee, contractor, or agent would have had but for the discrimination, 2 times the amount of back pay, interest on the back pay, and compensation for any special damages sustained as a result of the discrimination, including litigation costs and reasonable attorneys' fees.

31 U.S.C. § 3730(h).

100. As discussed *supra*, Boeing retaliated against Relator as a result of his repeated complaints about Boeing's failure to ensure that the software operating the SLS rocket was reliable and safe and provided in accordance with Boeing's contract with the United States.

101. Mr. Perrotti has suffered economic loss as a result of Defendant's retaliatory acts and is entitled to relief pursuant to 31 U.S.C. § 3730(h).

XII. Causes of Action

A. Count I – Presentation of False or Fraudulent Claims (31 U.S.C. § 3729(a)(1)(A))

102. Relator realleges and hereby incorporates by reference each and every allegation contained in all paragraphs of this Complaint.

103. Defendant has knowingly presented false or fraudulent claims associated with its contract with NASA to develop the SLS rocket, contract no. NNM-12AA-82C.

104. Boeing's contract with the United States requires it to provide a high-quality rocket that operates reliably and safely. When Boeing submitted invoices to the United States seeking payment for work performed under the contract, it certified, both expressly and impliedly, that it performed the work as required. In reality, however, Boeing failed to ensure that the software in the SLS rocket met the quality standards for which NASA bargained.

105. Pursuant to 48 C.F.R. § 32.905(a), the basis for payment is on receipt of a proper invoice and satisfactory contract performance. Boeing caused the United States to make payments for services and a product that it would not have made had it known that Boeing failed to adequately staff the project and implement sufficient quality control procedures. The United States only pays for goods and services that are provided in conformity with contract specifications.

106. Boeing's violations of the contractual requirements were material, because they went to the very essence of the bargain for which the United States contracted. The United States believed it was paying for high-quality, bug-free software for the SLS rocket. Boeing instead invoiced the United States for software that it failed to rigorously test. Had the United States known of Defendant's unsatisfactory performance, which resulted in the submission of ineligible claims for reimbursement, the United States would not have paid the claims.

107. The United States paid the false or fraudulent claims.

108. By virtue of Defendant's actions, the United States has suffered damages and is entitled to recover treble damages plus a civil monetary penalty for each false claim.

B. Count II – Making or Using False Records or Statements Material to False or Fraudulent Claims (31 U.S.C. § 3729(a)(1)(B))

109. Relator realleges and hereby incorporates by reference each and every allegation contained in all paragraphs of this Complaint.

110. Defendant knowingly made or used false records or statements material to false or fraudulent claims paid or approved by the United States. These false statements or records include misrepresentations to NASA regarding Boeing's true progress on the SLS project, as well as certifications related to services performed on the SLS rocket. Boeing also falsely certified that the invoices it submitted to the United States were correct and proper for payment.

111. Boeing's false statements and false records were material to the claims paid by the United States, because they went to the very essence of the bargain for which the United States contracted. The United States believed it was paying for a high-quality, safe rocket capable of reliably transporting astronauts to Mars and other deep-space destinations. Boeing instead invoiced the United States for a rocket with flawed software. Had the United States known of Defendant's unsatisfactory performance, the United States would not have paid the claims.

112. Defendant's false statements and records were material to the Government's decision to pay the claims. Boeing caused the United States to make payments for services and a product that it would not have made had it known that Boeing had such shoddy quality control procedures and employed insufficient resources. The United States only pays for goods and services that are provided in conformity with contractual requirements.

113. The United States paid the false or fraudulent claims.

114. By virtue of Defendant's actions, the United States has suffered actual damages and is entitled to recover treble damages plus a civil monetary penalty for each false claim.

PRAYER FOR RELIEF

115. WHEREFORE, Relator respectfully requests that the Court enter judgment against the Defendant and award the following:

(1) Damages in the amount of three (3) times the actual damages suffered by the United States as a result of Defendant's conduct;

(2) Civil penalties against Defendant up to the maximum allowed by law for each violation of 31 U.S.C. § 3729;

(3) The maximum award Relator may recover pursuant to 31 U.S.C. § 3730(d);

(4) All costs and expenses of this litigation, including attorney's fees and costs of court; and

(5) All other relief on behalf of Relator or the United States that the Court deems just and proper.

C. Count III – Retaliation (31 U.S.C. § 3730(h))

116. Relator realleges and hereby incorporates by reference each and every allegation contained in all paragraphs of this Complaint.

117. In violation of 31 U.S.C. § 3730(h), Defendant retaliated against Relator as a result of lawful acts he conducted in furtherance of efforts to stop Defendant from committing violations of the False Claims Act. Specifically, Boeing retaliated against Relator as a result of his repeated complaints about Boeing's failure to ensure that the software operating the SLS rocket was reliable and safe and provided in accordance with Boeing's contract with the United States.

118. Relator has suffered economic loss as a result of Defendant's retaliatory acts and is entitled to relief pursuant to 31 U.S.C. § 3730(h).

PRAYER FOR RELIEF

119. Relator prays that the Court enter judgment against Defendant for the following:

(1) Two times the amount of Relator's back pay;

(2) Interest on Relator's back pay;

(3) Compensation for special damages sustained by Relator as a result of Defendant's actions;

(4) Litigation costs and attorney's fees; and

(5) Any other relief the Court deems just and proper to make the Relator whole.

XIII. DEMAND FOR JURY TRIAL

120. Pursuant to Federal Rule of Civil Procedure 38, Relator demands a trial by jury.

XIV. DOCUMENTARY EVIDENCE

121. The documentary evidence referenced herein consists of the following:

Exhibit No.	Description	Bates No.
1	December 15, 2019 (2:21 AM) email from Relator to Mathew Weaver and Eric Gietl	REL000001–2
2	December 19, 2019 email from Relator to Mark Sholtis with EASI	REL000003–7
3	Relator's timesheet for April 16, 2019	REL000008–13
4	August and December 2019 email chain regarding "trac 3342"	REL000014–15
5	December 15, 2019 (2:48 PM) email from Relator to Mathew Weaver and Eric Gietl	REL000016

Respectfully submitted,

BERG & ANDROPHY

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CERTIFICATE OF SERVICE

I hereby certify that on February 24, 2020, I caused a true and correct copy of this Original Complaint to be served on the United States Department of Justice and the United States Attorney's Office in the Southern District of Texas via certified mail, return receipt requested.

Janis G. Gorton